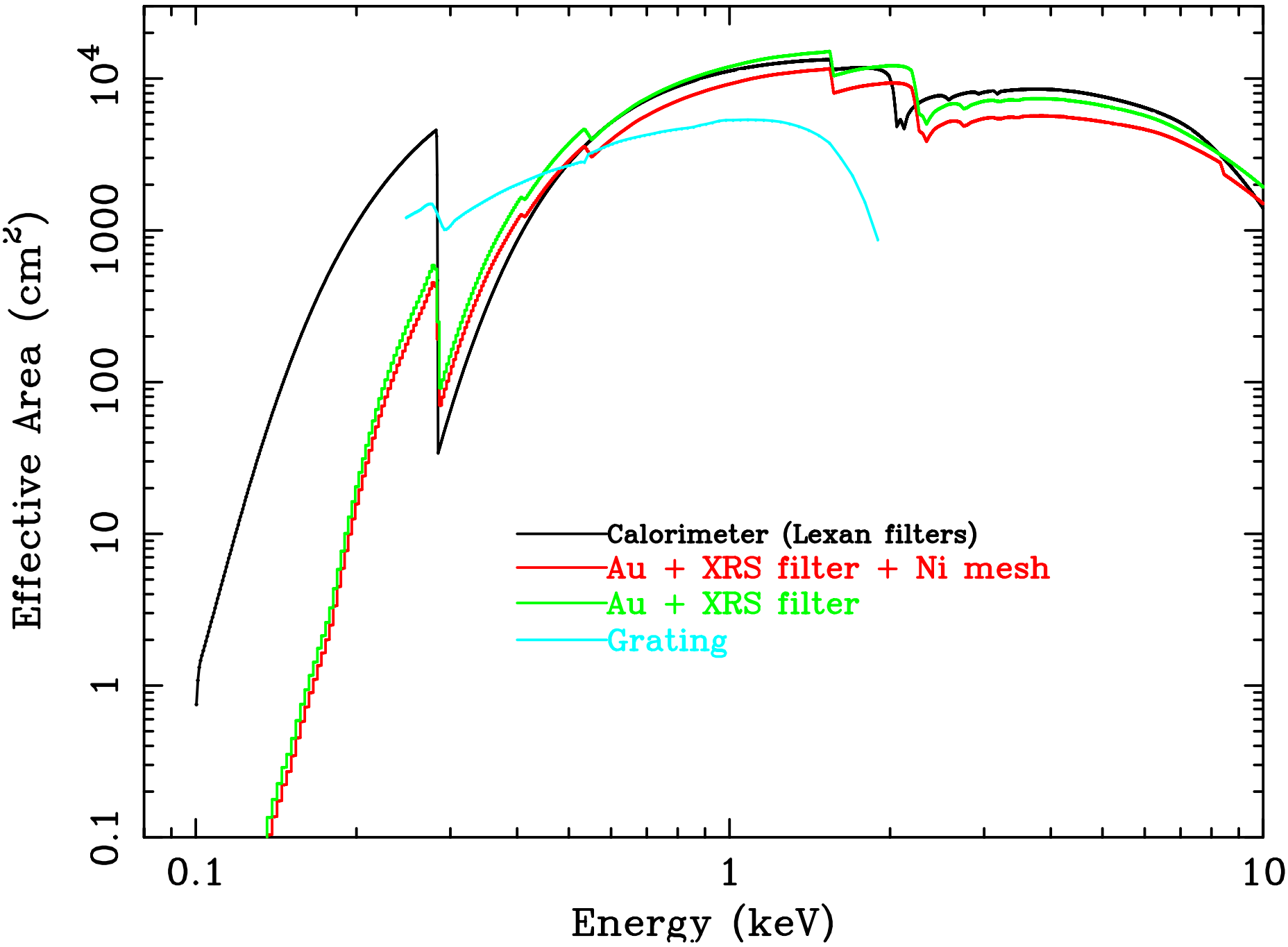
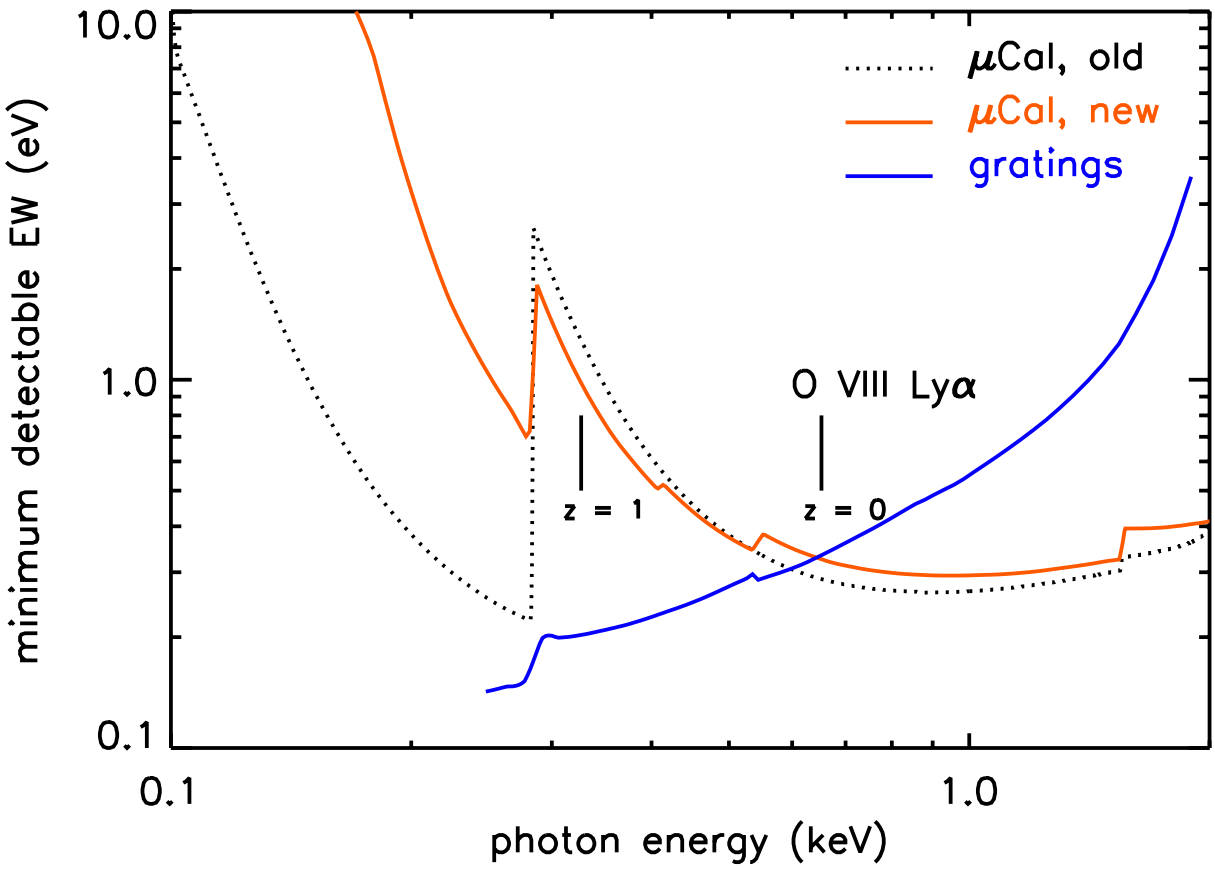
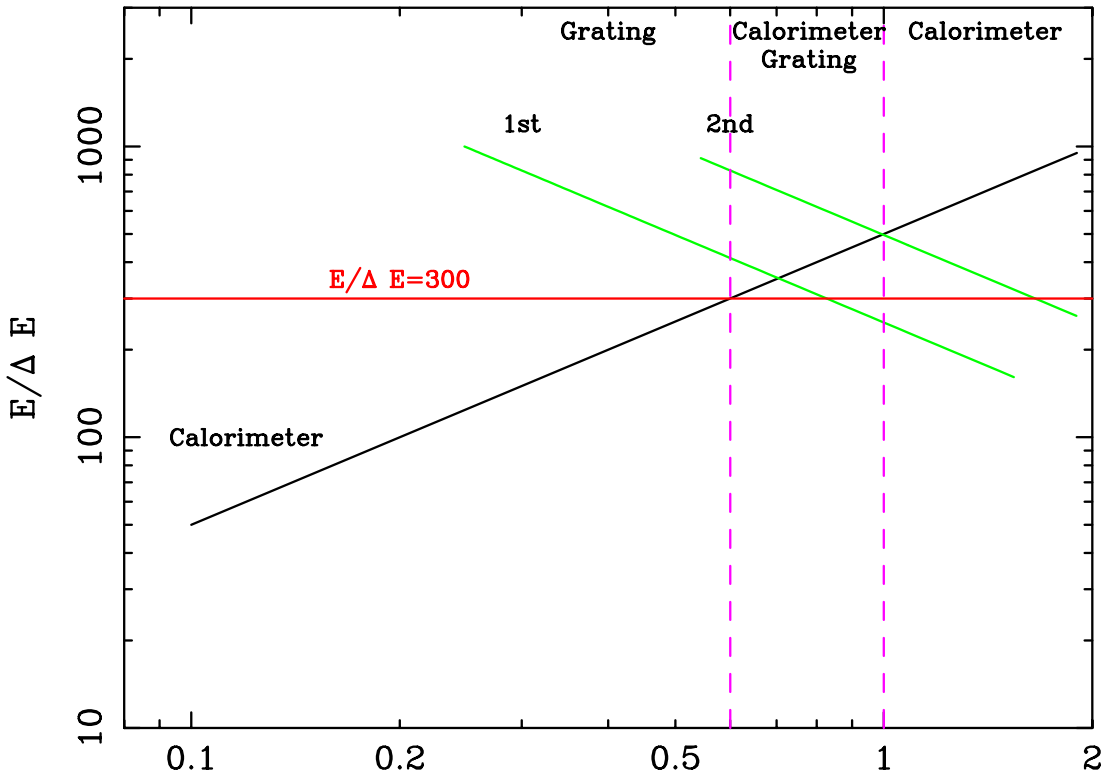

Effective Area (cm^2)
0.1
1
10
100
1000
10^4
0.1
1
10
Energy (keV)
Calorimeter (Lexan filters)
Au + XRS filter + Ni mesh
Au + XRS filter
Grating

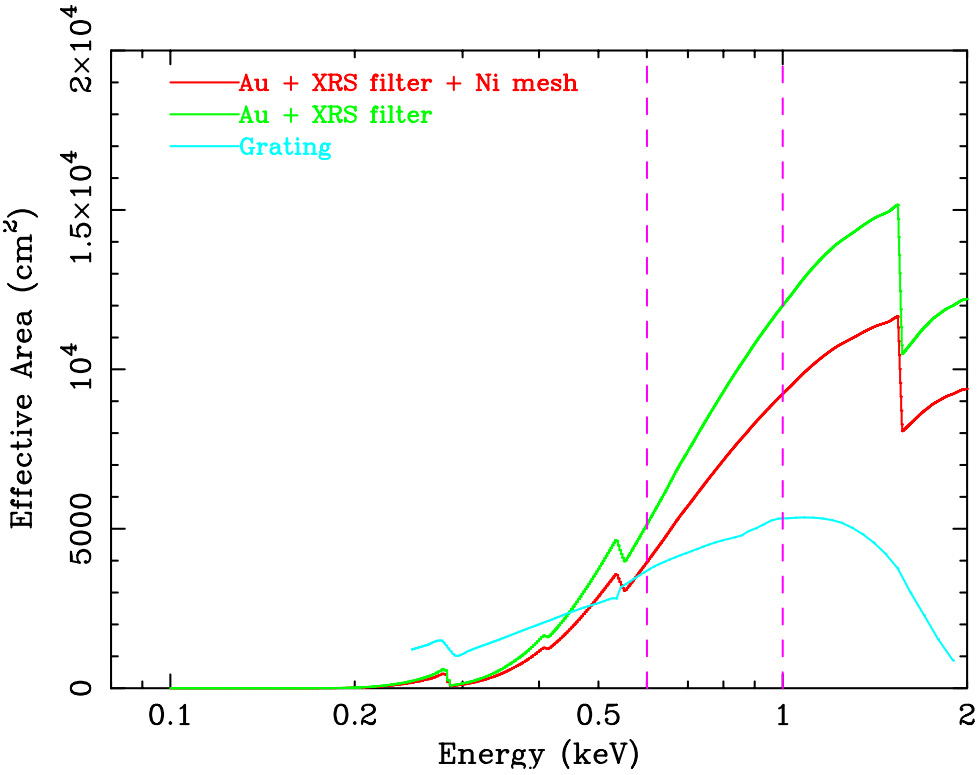

10.0
1.0
0.1
0.1
1.0
minimum detectable EW (eV)
photon energy (keV)
μCal, old
μCal, new
gratings
O VIII Lyα
z = 1
z = 0

Choice of Blocking Filter Issues: Lexan vs. Aluminized Polyimide

Aluminized Polyimide yields

- Factor of 6-7 lower effective area below 0.3 keV
- O and N edge
- Stronger
- Less water permeability issues
- Mesh vs. no mesh option results in 20-30% difference in effective area above 1 keV


Grating
Calorimeter
Grating
Calorimeter
1st
2nd
E/Δ E=300
Calorimeter
E/Δ E
1000
100
10
0.1
0.2
0.5
1
2


Au + XRS filter + Ni mesh
Au + XRS filter
Grating
Effective Area (cm²)
2×10⁴
1.5×10⁴
10⁴
5000
0
0.1
0.2
0.5
1
2
Energy (keV)

Some observations…

• Below 0.6 keV, grating is the instrument of choice. Both effective area and resolution of the grating are better than that of the microcalorimeter.

• 0.6--1 keV, calor has a resolution of 300 or better and larger effective area than the grating. Depending on the science goals, both could be the instrument of choice.

• Above 1 keV, the calor has substantially better effective area and resolution and is the instrument of choice. Above 1 keV, the grating is useful for cross calibration with calor.

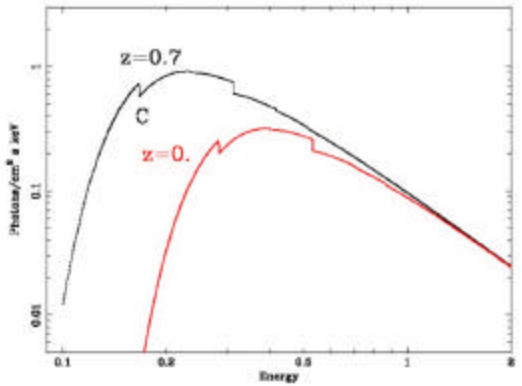
• In lieu of the loss of substantial effective area below C edge for calor, it is most beneficial to move down the energy range of the grating by 0.1 keV (if possible) for the following reasons…

Science areas that would benefit from lower energy effective area…

- High Redshift Universe

  AGN/QSO/Starburst

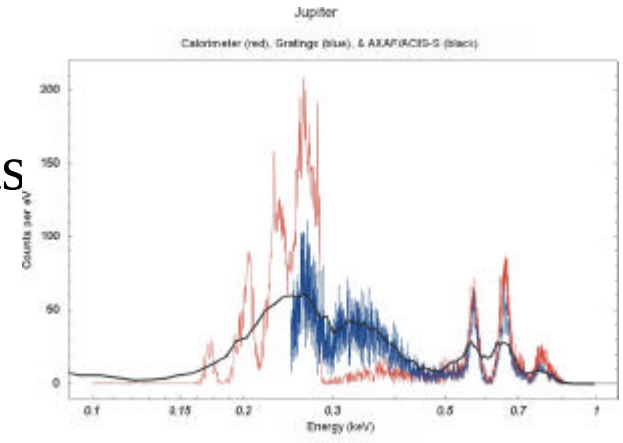
  Clusters



Fe L falls around E~0.25 keV for z~2 objects

- Galactic Halos at moderate redshift

  C edge at E~0.18 keV for z~0.7 objects



- Solar System science

  Energy down to 0.1-0.15 keV needed